Dry cured meat products are well known for their singular sensory characteristics. Traditional methods require long processing times. However, Quick-Dry-Slice (QDS) process technology makes it possible to reduce this time by accelerating the drying period, which is the slowest part of the process.

QDS process technology is based on a continuous system that combines air drying and vacuum drying of the meat product’s slices. Industrial implantation of the process has been carried out, in an initial stage, in the processing of fermented sausages, which can also be smoked.

There is a wide variety of these products in European, American and Asian markets, each of them with its peculiarities.

Some are marketed with a weight loss of only 10%, while some reach weight losses that exceed 40%. Each product has its optimum moisture content by which it is characterised.

QDS process drying

The drying technology of the QDS process is based on a drying-maturing system proposed by Comaposada, Arnau, Gou and Monfort (2004) for sliced products, whereby the dry-cured chorizo undergoes a stage of fermentation until the desired pH is obtained, then are frozen until the optimum slicing temperature is reached, after which they are sliced and then dried by means of the QDS process, which requires times of under 60 minutes depending on the weight loss desired (Fig. 1).

Industrial equipment

On an industrial level, the QDS process cannot be understood as an isolated piece of equipment, but as an element that must be integrated in a complete line that includes slicing of the product and delivery of the slices to the nucleus of the process, which is QDS drying.

Also, once dried and cooled, the slices must be overlapped in the desired format and packaged in vacuum or modified atmosphere packets. A QDS process line with an average production capacity of 400 kg/h is illustrated in schematic form in Fig. 2.

Technological advantages

- **Improvement of the regularity in product:** The QDS Process lines control individually the weight variation of the sliced product transported on each tray (identified by means of an RFID tag) ensuring a much better homogeneity inside the batch and between batches. This better regularity also has an economic impact as reducing the standard deviation of the weight loss allows the average yield to approach the upper limit allowed by the product legislation.

- **Reduction of the risk of alteration:** The quick drying and the high degree of control in the QDS Process lines avoid most of the risks which a traditional product undergoes during its long drying stage, as irregularities or malfunctions in the drying chambers with variations in moisture and temperature or as crossed contamination with undesired microbial flora.

Continued on page 13
The speed of the Q D S Process completely avoids the growing of moulds on the product surface.

**Better colour of the final product:**
During the traditional drying process, the long time produces oxidation reactions in the fat with a release of intermediate peroxides that oxidises the meat pigments, causing a degradation in the product colour. QDS process products always show a more intense and less brown colour than the standard products as most of these oxidation reactions do not happen because of the short processing time.

**Avoids crusting on the external slice:**
The traditional drying process forms a crust of drier product on the surface of the sausage that, if excessive, prevents drying of the internal part of the sausage, producing slices too soft in the centre and too dry on the outside. The QDS process completely avoids this effect obtaining totally uniform slices.

**Economic advantages**

- **Less space requirements:**
  A QDS Process line for the production of 400kg/h represents a reduction on the floor occupied by drying chambers of some 800m² for a product with a four week drying period.

- **Reduced working capital:**
  In the traditional system a drying product stock equal to the production capacity of all the drying time has to be kept in the drying chambers. The QDS Process lines allow for releasing this capital and saving the associated financial costs.

- **Reduced energy consumption and environmental impact:**
  The fact that the QDS Process drying can be done at higher temperatures than the traditional process without risking product safety allows for the use of free-cooling technologies which take advantage of the outside air for drying. The energy savings will depend on the climate characteristics of the factory area and also on the product manufactured, but can be quantified at around 30% in the Mediterranean area and will be higher the cooler the climate.

- **Use of cheaper casing:**
  As the product spends less time inside the casing, cheaper casings with different characteristics can be used. In some products it is also possible to think of using plastic casings, which are much cheaper.

**Operational advantages**

- **Simpler production planning:**
  One of the great barriers for manufacturing raw cured products is the long anticipation time required to plan the production. The reduction of the process time to 2-3 days enables a new and much faster reaction to changes in market demand (especially regarding marketing promotions of large distribution companies).

- **Independent fermentation and drying:**
  The QDS process allows for fermenting product batches, freezing them and keeping them frozen for long periods, drying them in hours when required.